



A REVIEW OF LITERATURE ON THE DETERMINANTS OF THE DEMAND FOR HOME LOANS

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ABSTRACT

The housing finance sector in India has come a long way from a highly subdued and regulated sector to a vibrant and competitive sector with several players vying for a larger pie. Increased competition is witnessed in the way home loan products are structured and offered. The literature on housing finance too has matured with more in-depth analysis of borrower behavior and determinants of their demand for home loans. In fact, the vast literature on housing finance encompasses several aspects of the multi-dimensional subject and as such can be segregated under broad classification depending upon the dimensions covered. An attempt has been made to bring together studies related to one of the aspects of the housing finance sector and that is, the studies on the determinants of the demand for home loans by borrowers.

KEYWORDS: Home Loans, Income, Interest rates, House prices, Inflation.

INTRODUCTION:

The housing finance sector in India has come a long way from a highly subdued and regulated sector to a vibrant and competitive sector with several players vying for a larger pie. Increased competition is witnessed in the way home loan products are structured and offered. The literature on housing finance too has matured with more in-depth analysis of borrower behavior and determinants of their demand for home loans. In fact, the vast literature on housing finance encompasses several aspects of the multi-dimensional subject and as such can be segregated under broad classification depending upon the dimensions covered. An attempt has been made to bring together studies related to one of the aspects of the housing finance sector and that is, the studies on the determinants of the demand for home loans by borrowers.

Housing is a lumpy asset that demands savings of a lifetime from a household. Both, the availability of housing finance as well as the cost at which it is available are individually and collectively crucial factors for potential homeowners. Thompson (1947) states that shelter financing is one of the most important components of finance. He attributes the expansion in the housing units in the US, in the early 1940s, to the easy availability of cheap housing finance. Grebler and Maisel (1963) state that no matter how housing problems be defined, credit has almost always been treated as the means to their solution. Though the various analyses may vary on matters of emphasis and detail, they conclude that short-run fluctuations in residential construction activities have resulted mainly from changes in financial conditions such as ease of borrowing, availability of mortgage funds, or supply of mortgage credit. Finance brings the opportunity for households to extend their purchasing power outside the bounds of what their current income permits (Lindsay 1971). But the possibilities of availing finance are limited and involve a cost. In analyzing the impact of housing finance, Swan (1973) emphasized the need to distinguish between stock of existing housing units and the flow of new units because the former includes vacant units as well. According to him, conventional wisdom suggests that changes in the cost and in the availability of housing credit affects the actual number of housing starts and not the demand for housing. The latter is determined largely by demographic factors. Moreover, demand for housing can be met by vacant units too.

To quote Kearn (1979), "The mortgage market is important for housing precisely because it makes the asset divisible and therefore allows a household to more closely adjust its asset portfolio as desired." This speaks volumes about the significance of housing finance for an individual home buyer as for the economy. Stutz and Kartman (1982) suggest that the availability of housing finance has two aspects: it can be viewed as a demand factor in terms of long-term mortgages or as a supply factor when treated as construction loans. Bandyopadhyay and Saha (2009) consider easy access to bank finance at affordable rates to be among the most significant drivers of the growth of housing market in India. Nenova (2010) too asserts that availability of housing finance enables a larger proportion of the population to become home owners. According to the author, "Housing finance plays a critical role in the development process by supporting strong housing markets, while strengthening the financial sector and contributing to overall economic growth." This indicates the scope of housing finance in impacting the development of a comprehensive housing sector.

The paper focuses on three most significant determinants of the demand for home loans and presents the studies that have analyzed the same. These are, income of the borrower including the nature of the income whether current or

future expected and monetary or real and fixed or variable, wealth of the borrowers, and so on. Other important determinants of the demand for home loans are the rate of interest and rate of inflation and house prices. The following sections present the studies under each of these categories.

Studies on the Role of Income of Borrowers:

The demand for housing finance is an important indicator of the vibrancy of the housing finance sector. Several factors such as, incomes of the borrowers, the interest rate on home loans and the rate of inflation can independently and collectively influence the demand for housing finance. Although traditionally viewed as a basic necessity, housing is considered to be relatively income-inelastic; but if seen as a composite good that includes the gradient of services and amenities, it is a comfort good exhibiting income elastic behaviour. Charles (1977) expects demand for housing to be sensitive to economic variables. Income therefore plays a major role in demand for housing and thereby for housing finance. The role of income is incorporated in terms of monthly repayment burden that a potential borrower can be exposed to. This makes income level a constraint variable in the model of demand for housing finance.

Several studies point towards the sensitivity of demand for housing finance to the income variable. Gelfand (1966, 1970) suggests that lenders can choose borrowers with stable incomes in the case when credit terms are too liberal. The relationship between housing finance and income is manifested in the fact that it enables households to spend more than what their current income permits (Lindsay 1971).

Using ordinary least squares estimation, Arcelus and Meltzer (1973) found the demand for housing services to be positively influenced by real income and negatively by rental price of housing. They measure real income in terms of real consumption expenditure. Incidentally, the authors consider real income as an argument in the demand for housing services but not in the demand for new housing. Their line of reasoning is that when real income increases households tend to increase their housing expenditures, pushing up the rental price of housing. This in turn induces increase in the demand for new housing units. It is not clear how the authors purport to differentiate the demand for housing services from that of new housing units. They also postulate that anticipating increase in housing expenditure, households would increase the demand for new housing. Thus, demand for new housing is hypothesized to be a function of rental price of housing, the anticipated housing expenditure, the cost of credit, price of new housing as well as the owner's equity in houses as a proxy for real wealth. The authors have included too many intertwined variables in the model. The inclusion of the variable, 'owner's equity in houses' does not seem to be logical. In the purchase of a new housing unit, higher owner's equity in houses would imply lower loan-to-value ratio which logically would discourage demand for housing, and as such cannot be taken as a proxy for real wealth, perhaps until the entire loan is paid up. Further, it is not clear how the authors reconcile inclusion of both the price of new housing unit as well as owner's equity in the demand equation. For a given loan-to-value ratio, the two variables are bound to be highly correlated.

Rosa (1978) found that mortgages increased with increase in net worth, real disposable income and house prices. The researcher has used the Brainard-Tobin portfolio model which encompasses range of assets and liabilities of a household such as real income, physical and financial assets, and mortgages and other consumer loans. Therefore the net worth is found to be more deterministic as a con-

straint rather than the real disposable income which is just one component of net worth. As regards house prices, the researcher does not clarify how they have been measured.

The housing market does not differ much from other markets in that the interaction between demand and supply forces produces a price that allocates buyers to the dwelling whose value is matched by their income (Kirby, 1976). He makes an important observation in this context. He states that the linearity between the demand and supply of housing vis-à-vis house prices is hampered by the tendency of lenders to discriminate between households with regard to their type of income. For instance, it is observed that people with lower but regular income are more likely to be eligible for home loans than those with higher but variable incomes.

The significance of income and wealth in the demand for housing is also borne out by the fact that for any household, owning or producing a dwelling unit involves a high capital investment that commands savings of an entire lifetime or even more (Palvia 1980). As regards the income variable applicable in the analysis of demand for housing finance, Kent (1980) considers permanent or normal income to be decisive in positively affecting the demand for housing services. In the model of home mortgage constructed by him, the author considers the demand for housing finance in real per capita terms, which in turn, is influenced by the real per capita demand for housing services. The demand for home mortgage fund is posed as a function of real per capita permanent income and the price of rental housing in real terms taken as a close substitute for owner-occupied housing. Households tend to determine their home ownership affordability by comparing monthly installments on home loans vis-à-vis rentals in relation to their normal income. The values of permanent income are obtained through an equation involving an adjustment coefficient with respect to the current income and the trend rate of income growth over the permanent income value of the previous period. Results obtained for the estimation period of nine years show that increase in permanent income has a positive impact on the demand for home mortgage funds. Decrease in price of rental housing was found to have reduced the demand for mortgage finance for most part of the period of estimation.

Reidy (1983) states that a priori decline in real income adversely affects the ability of households to afford housing; although no quantification of the claim has been provided by him. Dynarski and Sheffrin (1985) lay stress on the role of transitory income in determining the ability of households to make down payments and thereby it's bearing on the total demand for housing credit. Transitory income is measured as the difference between disposable and permanent income. We differ in opinion from Dynarski and Sheffrin with regard to their logic that transitory income is significant in influencing purchase decisions, particularly, the timing of house purchase decision. In our view, it is unlikely that households take such a major decision as house purchase on the basis of accruals of transitory income, which by its very nature is unanticipated. In our opinion, it is the current and the anticipated income that are the significant determinants of house purchase decision. Positive transitory income, if synchronous with house purchase decision can help households to economize on the amount of housing finance required; otherwise at best, it would logically be more consequential in making prepayments. As regards the measurement of permanent income, the authors depart from the traditional method of using distributed lags of past disposable incomes as a proxy. Instead they use changes in household's food consumption as a measure of the changes in permanent income. Their reasoning is that aggregate data on income underestimate the extent of variations and volatility while individuals are more certain about the changes in their income situations. This is why aggregate data generally tends to reject the permanent income measured in traditional manner even as it finds support in microeconomic panel data (Lucas, 1977, Mankiw, 1982 and Bernanke, 1983, as cited in Dynarski and Sheffrin, 1985). To obtain values of permanent income, the authors first estimate a permanent income demand curve for food adjusted for family size, and then calculate the change in permanent income on the basis of the change in food consumption.

J. Sa-Aadu and Sirmans (1995) include annual income of the borrower as well as the average percentage change in income as arguments in the borrower's choice between fixed versus adjustable rate mortgages. Their report that the level of borrower's income appears to have no effect but expectations of increase in incomes reduced interest rate sensitivity, making borrowers more inclined to use adjustable rate mortgages. Srinivas (1996) cites low and uncertain incomes as well as low levels of assets of urban poor as the major reasons for commercial banks to neglect their housing finance needs. Similar findings are reported by Saleh (1999) based on multi-clustered stratified sample data of households residing in informal settlements in Jakarta, Indonesia. The study indicates that mortgage loans were inaccessible to majority of households employed in the informal sector due to the nature of their incomes and the strict requirements of loan collateral by the formal housing finance sector.

In an empirical study, Hendershott, Pryce and White (2000) examine the impact of phasing out of home mortgage interest deduction from taxable income for home buyers on borrowers' decision on the amount of debt they were willing to take. The study is based on a sample of 117,000 home loans in the UK over the period from 1988 to 1998. The researchers found that removal of interest deductibility resulted into borrowers reducing the initial loan-to-value ratios and that this effect varied with household age, loan size, and tax bracket.

Quigley and Raphael (2004) state that housing choices are more likely to be based on assessment of permanent incomes made by households themselves rather than current annual income, because households would not adjust their housing consumption to short run fluctuations in income. In another study based on a sample analysis of 13487 home loan accounts with leading housing finance companies and public sector banks, Bandyopadhyay and Saha (2009) found that more than 90 percent of borrowers belonged to the category of 'employed', while the remaining borrowers were either self-employed, unemployed or pensioners. It indicates the high value that lenders place on regularity of income in sanctioning loans. Further, their least square dummy variable regression model suggests that housing demand is sensitive to income and house prices, although the demand elasticity with respect to the two variables are less than one. The significance of the income variable is further substantiated by the fact that lenders were found to be more inclined to lend to relatively younger borrowers for the longer residual working life they implied. The variable 'number of dependents in a household', indicating its financial liability exhibited statistically significant negative effect on the demand for housing. The merit of their model is that the effect of income level in absolute terms is qualified by additional determinants of affordability in the form of relevant borrower characteristics.

Bhide, Gupta, Buragohain, Sethi, Kumar S. and Bathla (2009) cite uncertainty of rural incomes as the major deterrent for formal housing finance to reach out to rural demand for housing finance. Kumar Jayant and Fulwari (2012) found that anticipated income of households provided better explanation for the variations in the demand for home loans in Gujarat rather than the current income levels. Kumar Jayant and Fulwari (2016) also report high positive income elasticity of the demand for home loans. Similar study by Fulwari (2017) for the rural population also found significant impact of the income variable on the demand for home loans.

Studies on the Role of Home Loan Interest Rates:

The rate of interest on housing finance is a priori one of the most fundamental factors affecting the market for housing finance. It has received much attention in the literature for its impact on the lenders and borrowers alike. Interest rate on home loans being the cost of borrowing is expected to negatively affect the demand for housing finance. In the pre-liberalization era, prohibitive home loan rates in India made house purchase possible only on retirement for a vast majority of middle-income households. However, financial liberalization and increased private participation has instilled strong competition among lenders compelling them to make competitive cuts in interest rates to woo potential borrowers. Increase in the demand for housing and for housing finance has coincided with the unprecedented decline in interest rates in India.

The crucial role of the cost of credit in housing finance can be gauged from the remarks of Fisher (1933) who considered interest and amortization on housing finance as a burden on families that increased the costs of shelter to a great extent. Dhrymes and Taubman (1969) found high negative effect of the regression of demand for mortgages on the mortgage rates. Wallich (1971) however, maintains that high demand elasticity for loanable funds with respect to interest rates could be misleading in the sense that the elasticity to a great extent depend on the ratio of debt service to borrower's income; that is, the higher interest rates need not deter borrowers if the debt service ratios are reasonably low.

Arcelus and Meltzer (1973) include a vector of rates of interest on financial assets, including mortgages, in the demand function for housing. Given the difficulty of getting reliable measures of interest rates on mortgages, they assume that open market interest rates provide adequate representation for the mortgage rates. Their regression results reveal that relative house prices, that is, the rental price of housing services, and interest rates were the principal determinants of the demand for housing, both having a negative impact. The authors maintain that the interest elasticity of housing demand suggests that "housing is a post-pone-able expenditure." While house prices, measured by the average cost of new housing units in the absence of reliable time series, appear with the expected negative sign in the demand function for housing, it is not found to be a significant variable. Moreover, the results reported by Arcelus and Meltzer show poor values for the D-W statistics in some models. It may be borne in mind that the study examines the determinants of demand for housing and not those for housing finance.

Fisher and Seigman (1972) consider the real rate of interest to be more relevant than the market rate of interest during periods of price rise. Meltzer (1974) found high interest elasticity of the demand for mortgage finance. Smith (1976) however, has cautioned that it is incorrect to conclude that mortgage rates are prohibitive without comparing them with the long-term inflation and the wage rate. The author has formulated a hypothetical model of construction of an apartment building. He illustrates that ignoring the comparative rates of changes in other factors that increase the cost of housing, such as, rates of general price rise vis-à-vis house price rise; rates of increase in labour costs in construction sector vis-à-vis manufacturing sector, etc., may lead to the erroneous conclusion that mortgage rates need to be lowered. He explains that lowering of the home loan rate may increase housing demand only because it compensates or negates the effect of rising inflation and wage rates and not because it was high in the first place. This has important policy implications, in the sense that, provision of subsidized housing finance should not be seen in isolation from efforts to remove market

imperfections.

Starr (1975) proposes lowering of mortgage interest rates to increase the availability of housing to moderate and low-income borrowers. Rosa (1978) examined the relationship between housing demand and interest rate on housing finance and found it to be highly elastic. The demand for housing was regressed on three alternative interest rates, namely, the average of time and savings rate, the bond rate, and the secondary market yield of mortgages. As regards their impact on mortgages as a part of the consumption model of households, the interest variables had the expected signs but were not found to be significant.

Kearl (1979) has estimated the interest elasticity of down payment and loan maturity. Results indicate that down payment is found to be elastic to the nominal interest rate, more so at higher rates. At higher nominal interest rates, down payments are bigger, which implies that households economize on housing loans. The relationship between loan duration and interest rate is found to be negative implying that higher nominal rates reduced the maturity of the loan contract, which is another evidence of the sensitivity of households' demand for housing finance to different terms of housing loan.

Kent (1980) posits the demand for housing finance as a negative function of the real home loan interest rates. The alternative interest rates used in the model include the mortgage rate and the bond rate as competing interest rates. These variables were not found to be direct determinants of the demand for housing finance as they worked indirectly through the user cost term. The user cost is determined by the credit terms such as the loan-to-value ratio, the home loan interest rate, the loan contract term, and the price of the home.

Green and Shoven (1986) have examined the effect of interest rates on the prepayment behaviour of home loan borrowers. They state that the effective tenure of the mortgage asset is determined internally by the way interest rates evolve. If the prevailing interest rate is lower than the contract rate borrowers are induced to prepay the loan, subject to prepayment penalties, by acquiring a new loan. Most mortgages usually have a "due-on-sale clause meaning that the lender can claim the face value of the mortgage if the borrower sells the residence." If the current rate is higher than the rate at which the loan has been contracted, the homeowner is mandated to give up a below-market rate loan if he sells the house. However, this option will not be forced upon him if the prevailing interest rate happens to be lower. Based on prepayment cases of panel data on 4000 individual mortgages of two Saving and Loans Associations based in California between the years 1975 to 1982, the researchers found that interest rates are important determinants of the average age of prepayment. Thus the effective maturity period of a loan is highly dependent on interest rates.

Clauretie and Herzog (1990) found that loan losses for lenders reduced when regressed on rising property prices and rising interest rates. The reason is that an increase in the current market rate of interest reduces the incentive for borrowers to default on the mortgage carrying lower rate. Flavin and Yamashita (2002) consider the nominal mortgage interest rates as costs of home ownership; Khan (2003) considers highly prohibitive mortgage rates the reason behind extremely poor access to housing finance for majority of the population in Pakistan; although no empirical tests have been undertaken by the two studies.

Green and Wachter (2007) emphasize on the availability and cost of housing finance as crucial determinants in the functioning housing markets across countries. They cite decline in nominal prime interest rates from an average of 15 percent in 1980 to 4.4 percent in 2004 across several countries. The major outcome of this was improved access to housing finance, increase in demand for housing, and increase in house prices across most of the industrialized countries in the world. It is therefore clear that fall in interest rates induces higher demand for housing finance and has an impact on house prices; more so if there exists severe housing shortage. Decline in mortgage rates improved affordability while appreciation in house prices impaired it by necessitating larger housing loans. However, they found that home loan interest rates and an alternative rate on a competing bond did not directly determine the demand for home mortgage funds. This is because interest rates already appeared as determinants of the desired level of housing demand through the user cost term. The user cost of housing incorporates into one measure the various aspects of housing cost namely home loan interest rates, property and income taxes, maintenance cost, depreciation, expected capital gains, etc. (Rosen, H. S., Rosen, K. T., and, Holtz-Eakin, 1984).

Green and Wachter (2005) state that rising incomes and particularly the institution of long term, fixed rate, self-amortizing mortgages, that make housing finance affordable, were the prime reasons that increased home ownership rapidly in the US economy as borne out by census figures for 1940 and 1980. Mortgage insurance is also claimed to have positively influenced both lenders and borrowers, leading to expansion of mortgage finance. Inflation is stated to have caused increase in nominal interest rates and affected mortgage lending more than mortgage borrowing, in the face of fixed rate mortgages that prevailed at the time.

Ellis (2006) reports that the nominal mortgage rates declined during the phase of deflation in Australia and New Zealand in the 1980s and 1990s, with the consequence of improving the borrowers' capacity to make repayments. Going by the

practice of lenders of setting the ratio of initial repayment to borrower's income as a credit rationing guideline, more borrowers became eligible for mortgage loans, and the decline in inflation rates and nominal interest rates acted as important factors that increased the average size of new mortgages.

Chandrasekar and Krishnamoorthy (2010) conclude that affordability factors such as home loan interest rates and house prices, and availability of home loans are crucial in the demand for housing function. They employ regression analysis to study the impact of home loan interest rates, housing loan disbursements, inflation and house price growth on the housing demand in the US over the period from 1998 to 2009. They report significant negative impact of the interest rate and house price growth variables and positive impact of the home loan disbursements. While inflation was not found to be significant, it had a positive coefficient. The authors have also examined the same housing demand model for UK as well, for the period from 1995 to 2009. Regression results reveal that both mortgage availability and interest rates exerted significant positive effect on the demand for housing. House price growth was found to have a positive relationship with housing demand, suggesting that households gave importance to the investment value of housing asset which would result into capital gains on further price increases. They assert that households' expectations of capital gains provide further explanation for the positive effect of interest rate. Unlike in the case of the US economy, inflation was found to have significant negative impact on housing demand in UK.

Chandrasekar and Krishnamoorthy (2010) have also examined the housing demand function for the city of Hyderabad, using regression analysis. Using benchmark prime lending rates as a proxy for home loan interest rate, they found significant negative impact of lending rates on housing demand. However, given the single explanatory variable used in the model, the explanatory power of the model is only 33 percent. Important determinants like household income and house prices have not been examined by the authors.

Kumar Jayant and Fulwari (2012), in their analysis of the demand for housing finance in the state of Gujarat report that while in its individual capacity, the home loan interest rate had a negative impact on the demand for home loans, in conjunction with the income variable it was not found to be a significant determinant. Another study by Fulwari (2012) found urban demand for home loans to vary negatively with the variable home loan interest rate. Kumar Jayant and Fulwari (2016) and Fulwari (2017) also report high negative interest elasticity of the demand for home loans for urban and rural demand for housing finance, respectively.

Most of the studies while appreciating the role of interest rate, have not attempted to explain or contextualize the mortgage rates with other aspects of housing namely, house prices, tax incentives on home loans, income of prospective borrowers, etc.

Studies on the Role of Inflation and House Prices:

Some studies have examined the role of inflation in the demand for housing finance. Inflation affects housing affordability by increasing the nominal rates of interest. At the same time, it raises the equity value of the mortgaged housing asset, thereby accruing wealth for the households. How inflation affects housing demand depends on various factors such as the way anticipated inflation is integrated into the mortgage contract terms and the relative rates of change in house prices vis-à-vis general price levels.

Arcelus and Meltzer (1973) examine the link between market rates of interest, anticipated rate of inflation, wages and house prices. They state that when market rates of interest rise, and when expectations of higher inflation in the long run keep interest rates at the higher levels, it would not reduce housing demand permanently because after a time lag, wages and house prices would adjust to the higher anticipated inflation.

Economists do not agree on the role of anticipated inflation on the demand for housing finance. Kearl (1979) hypothesized that housing finance contracts that involve constant installment payments "lead to distortions in the housing market in the face of anticipated inflation." Since anticipated inflation is incorporated in the nominal interest on home loans, it increases the real burden of debt service for the households by increasing the annual amortization. This is because it is only in the future that inflation may induce higher nominal incomes. "Constant payment housing loan contracts" thus inflict a reallocation by households in favour of savings vis-à-vis consumption in the present. Since increase in household incomes lags behind the increase in inflation, the resultant mismatch between mortgage payment and income has two effects. Firstly, it disqualifies some households from availing home loans, and secondly, those who do qualify are compelled to lower the value of house purchased, and thereby the amount of home loan demanded.

The regression results derived by Kearl support the hypothesis that anticipated inflation affects relative house prices via its effect on nominal interest rates. His line of reasoning is that inflation affects maturity, down payments and the degree of risk of the loan, all of which increase the real cost of housing capital. This in turn dampens the demand for housing. Inflation induces increase in the initial payment and a preference for shorter-duration contract, particularly for fixed

nominal payment contracts. While Kearn limits his examination to contracts with fixed nominal payments, it is equally applicable to contracts involving variable interest rates and installments. In variable payment contracts, while it is possible to accommodate changes in the rate of inflation, the frequent adjustments in the rate of interest may induce potential borrowers to restructure their demand for home loans.

Similar findings are obtained from econometric analyses by Follain (1982) and Boehm and McKenzie (1982) which show that inflation dampens the demand for housing and reduces home ownership opportunities for households by increasing the nominal rates of interest. The interest cost effect outweighs the positive impact of capital gains and tax exemptions.

Contradictory views are expressed by Titman (1982) who has analyzed the effect of anticipated inflation in dictating the demand for housing. According to him, inflationary expectations combined with the policy of tax deductions on interest payments are found to induce the demand for housing. This is because the tax regulations are not indexed to the rate of inflation. It is the nominal interest payments and not the real interest payments that are tax deductible. This makes debt servicing cheaper in real terms and thereby increases the demand for housing. Anticipated inflation also increases housing demand because housing acts as a good hedge against inflation unlike stocks.

While the researcher has constructed mathematical models to explain the interrelationships between anticipated inflation, rentals, interest rates, tax payments and house prices, he does not provide any empirical analysis of the same. There is no explanation regarding how households form their expectations about rate of inflation. Moreover, his analysis is silent on the impact of inflation on nominal interest rate, which, a priori, must increase and thereby affect housing finance adversely. Not only may housing become unaffordable due to the inflationary rise in its real price but with the increase in the rate of interest, the affordability of housing finance too may get adversely affected. An analysis of the role of real as against nominal interest rate on housing loans in affecting the demand for housing finance would be more meaningful.

Reidy (1983) cites three factors, namely, excessive inflation, volatile interest rates and declining real incomes to severely affect housing affordability. These factors, according to him, seriously disrupt a country's mortgage finance. The author has however not substantiated this by any empirical examination. He considers policies of supply-side economics and restrictive monetary policy to be responsible for high inflation and escalating interest rates, which worsen the condition of the housing industry. The response of the mortgage finance industry to these problems has been the innovation of new types of mortgage instruments and new sources of funds for mortgage.

Inflation, whether current or anticipated, is accommodated in terms of higher nominal rates of interest on home loans. In this context, the issue of inflation causing a shift in the real mortgage debt servicing towards the initial years of the mortgage contract, termed as the 'tilt problem', is also raised by Alm and Follain (1984). The problem of tilt is particularly related to the case of 'Standard Fixed Payment Mortgage' (SFPM). In response to the real payment tilt problem they mention several alternative mortgage instruments (AMIs), such as, the graduated payment mortgage, shared-appreciation mortgage and price-level adjusted mortgages. The authors examine behaviour simulation models wherein household's choice is examined under different levels of household income and wealth, assumed rates of inflation, and the type of AMIs available to them. The impact of AMIs is measured in terms of the initial (lower) loan-to-value ratios implied by them. Effects of alternative levels of income and wealth work through the maximum home loans permissible, taking into account the mortgage payment-to-income ratio and the down payment requirements set by lenders.

The simulation results of the analysis by Alm and Follain reveal that moderate increases in the rate of inflation induce housing demand due to reduced user costs. High rates of inflation, on the other hand, reduce housing demand due to the liquidity constraints operating through higher nominal rates of interest and related credit terms as mentioned above. Results of simulations reveal that AMIs permit households to purchase homes with higher value and avail greater mortgage finance. The magnitude of the effects depends on the extent to which the AMIs reduce the initial loan-to-value ratio. The results suggest that AMIs are effective in reducing the 'tilt' problem; and thereby increasing housing demand even during inflationary phase.

Kapadia (1992) asserts that high and increasing prices of urban property made housing affordability a problem difficult to resolve even if housing finance were made easily available. The author has however not substantiated this claim with an empirical examination. Renaud (1996) states that a priori, higher rates of inflation, higher real rates of interest and falling real wages are individually potent factors that can curtail the demand for housing finance. However, he does not provide any empirical tests of the sensitivity to these factors. Campbell and Cocco (2003) discuss about the effect of expected inflation in increasing the nominal interest rates, which in turn lead to proportionate increase in nominal mortgage repayments, even though it is only an expected increase in the price level and not an actual increase. This makes real monthly payments under the adjustable-rate mortgages highly variable. Borrowers, in such cases would have less

preference for variable interest rate mortgages. The authors have carried out a normative analysis of borrower-characteristics that would suit either fixed rate mortgages or variable rate mortgages, in household risk management behaviour; however they do not test the results empirically.

Quigley and Raphael (2004) discuss the role of inflation in the context of housing affordability. Rapid increase in house prices makes home ownership difficult for renters. They differentiate between what affordability means for different income groups. Accordingly, for the higher income groups, affordability would mean the terms at which dwelling units can be purchased and the terms at which housing loans are available and can be serviced. For the lower income groups, housing affordability refers to the terms of rental contracts in relation to their incomes. Increase in income has favourable influence on housing affordability. However, increase in inflation increases both nominal interest rates and house prices, which negate any increases in nominal wages. Thus inflation adversely affects housing affordability. As policies to improve housing affordability, the authors suggest "graduated payments" in mortgage amortization in which monthly payments increase over time along with increase in incomes. They also advocate longer maturity periods so as to reduce monthly debt servicing and make households with lower current incomes eligible for housing finance.

The above enumeration of the rich literature on the determinants of demand for home loans categorized systematically under various heads provides a useful foundation for researchers in the area of housing finance. Further categories of studies related to housing finance can be similarly carried out to provide a wholesome base for researchers.

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